	DEQ AIR QUALITY PROGRAM 1410 N. Hilton, Boise, ID 83706 For assistance, call the **Air Permit Hotline - 1-877-5PERMIT**	**PERMIT TO CONSTRUCT APPLICATION** Revision 3 3/27/2007

Please see instructions on page 2 before filling out the form.

Company Name:	Cargill Environmental Finance
Facility Name:	East Valley Cattle
Facility ID No.:	1
Brief Project Description:	Dairy anaerobic digester which captures biogas to produce electricity through gensets.

POINT SOURCE STACK PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	**Stack ID**	**UTM Easting (m)**	**UTM Northing (m)**	**Base Elevation (m)**	**Stack Height (m)**	**Modeled Diameter (m)**	**Stack Exit Temperature (K)**	**Stack Exit Flowrate (acfm)**	**Stack Exit Velocity (m/s)**	**Stack orientation (e.g., horizontal, rain cap)**
Point Source(s)										
4 Guascor 560 Generators	1.00	292,509.00	4,723,768.00	1,280.00	8.23	0.25	628.00	791.67	39.93	vertical
(insert more rows as needed)										

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PERMIT TO CONSTRUCT APPLICATION

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4/5/2007

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Company Name:	Cargill Environmental Finance
Facility Name:	East Valley Cattle
Facility ID No.:	1
Brief Project Description:	Dairy anaerobic digester which captures biogas to produce electricity through gensets.

FUGITIVE SOURCE PARAMETERS

1.	2.	3a.	3b.	4.	5.	6.	7.	8.	9.	10.
Emissions units	Stack ID	UTM Easting (m)	UTM Northing (m)	Base Elevation (m)	Release Height (m)	Easterly Length (m)	Northerly Length (m)	Angle from North (°)	Initial Vertical Dimension (m)	Initial Horizontal Dimension (m)
Area Source(s)										
name of the emissions unit1										
name of the emissions unit2										
name of the emissions unit3										
name of the emissions unit4										
name of the emissions unit5										
name of the emissions unit6										
name of the emissions unit7										
name of the emissions unit8										
name of the emissions unit9										
name of the emissions unit10										
Volume Source(s)										
name of the emissions unit11										
name of the emissions unit12										
name of the emissions unit13										
name of the emissions unit14										
name of the emissions unit15										
name of the emissions unit16										
name of the emissions unit17										
name of the emissions unit18										
name of the emissions unit19										
(insert more rows as needed)										

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Please see instructions on page 2 before filling out the form.

Company Name:	Cargill Environmental Finance
Facility Name:	East Valley Cattle
Facility ID No.:	1
Brief Project Description:	Dairy anaerobic digester which captures biogas to produce electricity through gensets.

BUILDING AND STRUCTURE INFORMATION

1.	2.	3.	4.	5.	6.	7.
Building ID Number	**Length (ft)**	**Width (ft)**	**Base Elevation (m)**	**Building Height (m)**	**Number of Tiers**	**Description/Comments**
Mechanical Building	96.00	45.00	1280.00	6.71	1	Mechanical building nearest to the digester.
Building 2 ID						
Building 3 ID						
(insert more rows as needed)						

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PERMIT TO CONSTRUCT APPLICATION

Revision 3
03/26/07

Please see instructions on page 2 before filling out the form.

IDENTIFICATION		
Company Name: Cargill Environmental Finance	Facility Name: East Valley Cattle	Facility ID No: 1
Brief Project Description: Dairy Anaerobic Digester which captures biogas to produce electricity through gensets		

APPLICABILITY DETERMINATION		
1. Will this project be subject to 1990 CAA Section 112(g)? (Case-by-Case MACT)	☒ NO	☐ YES* * If YES, applicant must submit an application for a case-by-case MACT determination [IAC 567 22-1(3)"b" (8)]
2. Will this project be subject to a New Source Performance Standard? (40 CFR part 60)	☐ NO	☒ YES* *If YES, please identify sub-part: JJJJ
3. Will this project be subject to a MACT (Maximum Achievable Control Technology) regulation? (40 CFR part 63) THIS ONLY APPLIES IF THE PROJECT EMITS A HAZARDOUS AIR POLLUTANT	☒ NO	☐ YES* *If YES, please identify sub-part: _____
4. Will this project be subject to a NESHAP (National Emission Standards for Hazardous Air Pollutants) regulation? (40 CFR part 61)	☒ NO	☐ YES* *If YES, please identify sub-part: _____
5. Will this project be subject to PSD (Prevention of Significant Deterioration)? (40 CFR section 52.21)	☒ NO	☐ YES
6. Was netting done for this project to avoid PSD?	☒ NO	☐ YES* *If YES, please attach netting calculations

IF YOU ARE UNSURE HOW TO ANSWER ANY OF THESE QUESTIONS, CALL THE AIR PERMIT HOTLINE AT 1-877-5PERMIT

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APPENDIX B

Air Quality Modeling Protocol

KLEINFELDER
An employee owned company

April 24, 2008
Kleinfelder Project No. 93476

Mr. Kevin Schilling
Airshed Dispersion Modeling Coordinator
Idaho Department of Environmental Quality
Air Quality Division
1410 N. Hilton
Boise, ID 83706

SUBJECT: AMBIENT AIR QUALITY MODELING PROTOCOL for ANDGAR CORPORATION, EAST VALLEY CATTLE 2735 EAST 700 SOUTH DECLO, IDAHO 83323

Dear Mr. Schilling:

Kleinfelder is preparing a Permit to Construct (PTC) application on behalf of Cargill Environmental Finance for East Valley Cattle located in Declo, Idaho. The Project includes the installation of an anaerobic digester for processing onsite cow manure and four Genset electrical generators for conversion of the digester biogas to electricity. Andgar Corporation ("Andgar") will be installing the Genset electrical generators at the dairy. This modeling protocol is being submitted for approval to support the PTC application.

1 EXECUTIVE SUMMARY

The proposed Genset electrical generators will result in criteria pollutant emissions of carbon monoxide, particulate matter, nitrogen oxides, sulfur dioxide and volatile organic compounds. Modeling will be performed for the criteria pollutants, to demonstrate compliance with the NAAQS.

The proposed project will also result in potential emissions of non-carcinogenic toxic air pollutants ("TAPs") listed in IDAPA 58.01.01.585 including acrolein, isomers of xylene, selenium, styrene, toluene, and trichloroethylene. The potential emissions of these compounds are not expected to exceed their respective listed TAP screening emission levels ("EL") with the exception of trichloroethylene. In addition, the digester will result in emissions of carcinogenic TAPs listed in IDAPA 58.01.01.586 including acetaldehyde, benzene, dichloromethane, formaldehyde, nickel, trichloroethylene, and

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vinyl chloride. The potential emissions for acetaldehyde is not expected to exceed the listed TAP EL, however potential emissions for benzene, dichloromethane, formaldehyde, nickel, trichloroethylene, and vinyl chloride may exceed each of the respective TAP ELs. Therefore, modeling is expected to be required for these specific TAPs to demonstrate compliance with the Acceptable Ambient Concentration (AAC) for each pollutant.

This ambient air quality modeling protocol ("protocol") is being submitted to the Idaho Department of Environmental Quality, Air Quality Division ("IDEQ") for review. The Protocol was prepared consistent with the IDEQ Air Quality Modeling Guidelines ("Guidelines"), revised December 31, 2002, and the associated modeling protocol checklist (see Appendix B). The protocol addresses the approach for assessing the ambient air impacts from the proposed source emissions for comparison with the AAC/AACC for TAPs and National Ambient Air Quality Standards (NAAQS) for criteria pollutants.

We understand that IDEQ staff will review and approve the modeling protocol. If there are any questions or items of discussion, the following points of contact are available:

Andgar Corporation:

Mr. Kyle Juergens
6920 Salishan Pkwy. A-102
Ferndale, Washington 98248
(360) 366-9900
e-mail: kylej@andgar.com

Kleinfelder:

Mr. Andy Marshall, P.E.
2315 S. Cobalt Point Way
Meridian, Idaho 83642
(208) 893-9700
e-mail: amarshall@kleinfelder.com

2 INTRODUCTION AND PURPOSE

2.1. General Overview

Andgar is proposing to construct an anaerobic digester at East Valley Cattle. The anaerobic digester will be constructed for Cargill Environmental Finance, who in turn leases space on the dairy's property. The anaerobic digester is an independent source separate of the dairy.

The facility operates under SIC code 4911. The digester is designed to produce biogas from on-site dairy cattle manure. The resulting biogas will be used as combustion fuel in four on-site generators that will be used for primary electrical production for the facility or sold to the local utility. The four generators can operate independently or simultaneously. A PTC application will be submitted in support of the permitting for this new air emission source.

East Valley Cattle is a minor source because the potential to emit is less than major source thresholds without requiring limits on its potential to emit.

The facility is located in Cassia County, Idaho which is designated as attainment or unclassifiable for criteria pollutants. The approximate center point of the property is located at UTM 4723768 N by 292509 E, Zone 12. The surrounding area of the dairy is a sparsely populated, rural area with terrain at about 4,200 feet above mean sea level (MSL). A Site Location Map, Vicinity Map and Facility Layout Map are respectively provided as Figures A-1 through A-3 in Appendix A.

3 EMISSION AND SOURCE DATA

3.1. Facility Processes and Emission Controls Affected

The proposed source will allow for the production of electricity. Since this is the initial PTC located at East Valley Cattle, existing facility processes or emission controls will not be affected.

3.2. Emission Points and Future Emission Rates

An estimate of the potential emission rates for the proposed source is summarized in Table 3-1. Since this is a new source, the current emission rates for all of these pollutants are zero.

Table 3-1: Potential Emission Rates for Genset Generators

Pollutant	PTE (lbs/hr)	PTE (tons/yr)
PM_{10}	0.28	1.22
SO_2	20.05	87.8
NO_x	9.32	40.8
CO	20.51	89.8
VOC	9.32	40.8
Acetaldehyde	1.5E-03	6.4E-03
Acrolein	7.2E-04	3.2E-03
Benzene	1.9E-02	8.4E-02
Dichloromethane	2.8E-03	1.2E-02
Formaldehyde	5.3E-03	2.3E-02
Isomers of Xylene	3.8E-03	1.7E-02
Nickel	5.6E-05	2.4E-04
Selenium	3.1E-04	1.3E-03
Styrene	1.5E-03	6.4E-03
Toluene	7.3E-03	3.2E-02
Trichloroethylene	5.6E-04	2.4E-03
Vinyl Chloride	1.6E-03	6.8E-03

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There are four Genset electrical generators proposed to be installed adjacent to each other. The four 750 kW generators have their own 10-inch (0.254 meters) diameter stack extending 27 feet (8.23 meters) above ground. The emissions presented in Table 3-1 represent the total potential emissions if all of the generators were operating simultaneously, at capacity. In an emergency situation the biogas will be flared from the digester. During a flare event the emission characteristics and potential emission rate will be the same as the emission estimate from the Genset generators.

3.3. Good Engineering Practice (GEP) Stack-height Analysis

The exhaust stack from the Genset generators is 27 feet (8.23 meters) in height. Because the stack height is less than 55 meters and is located in simple terrain, the GEP stack-height analysis requires the use of the actual stack height in calculating emission limitations.

3.4. Facility Layout

The facility layout is provided in Figure 3, Appendix A. As shown, the new planned anaerobic digester and biogas electrical generators will be located at the street address 2735 East 700 South, Declo, Idaho. The leased property boundary which encompasses the generators is also shown in Figure 3. The closest leased property boundary is 100 feet from the generators. This boundary is considered the nearest public receptor to the source.

3.5. Source Parameters

The source parameters for the proposed anaerobic digester are summarized in Table 3-2. The stack velocity and stack temperature are estimates of average operating conditions.

Table 3-2: Source Parameters

Source Description	UTM E	UTM N	Stack Height (m)	Stack Diameter (m)	Stack Velocity (m/sec)	Stack Temp (Deg K)	Receptor Distance (m)
4-Guascor 560 generators	292509	4723768	8.23	0.254	39.93	628	30.48

3.6. Methodology for Including Emission Sources

The four proposed generator sources will be modeled as a single point source. Since the proposed generators are the only source of emissions, no other sources were considered in the modeling analysis.

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3.7. Methodology for Including/Excluding Sources from the Modeling Analysis

We did not include the digester flares in the modeling analysis. The use of the flares would only occur in an upset condition and the characteristics of the emissions will be the same as the characteristics of the generator emissions. The generators and the flares will not operate simultaneously; therefore, including the flares will not have any substantial impact on the modeling results.

4 AIR QUALITY MODELING METHODOLOGY

4.1. Model Selection and Justification

The emission rates from the proposed source exceed the modeling thresholds for criteria pollutants requiring ambient air quality modeling for the proposed source. To properly demonstrate compliance with the ambient air quality standards, the SCREEN3 model was chosen to assess the potential air quality impacts from the project. This model was chosen since the facility consists of a simple terrain and simple and isolated emission sources. SCREEN3 uses worst case meteorological conditions to estimate worst case emission impacts.

4.2. Model Setup and Application

The SCREEN3 model will be set up following the EPA Guidelines and generally recommended procedures. The modeling options will be kept as regulatory default. The modeling parameter inputs for this modeling assessment are listed in Table 3-2.

4.3. Land-use Analysis

Following the land–use classification procedure provided in Appendix E of the IDEQ Modeling Guidelines, the area within 3km of the site has been classified as rural. The majority of the 3km radius around East Valley Cattle is largely agricultural or undeveloped, with the ground cover being mostly wild grasses, weeds and shrubs, and sparsely located trees.

4.4. Building Downwash

The regulatory building downwash option will be used in SCREEN3. The building housing the Genset electrical generators has a height of 6.71 meters, a minimum horizontal dimension of 13.72 meters and a maximum horizontal dimension of 29.26 meters.

4.5. Terrain Options

The terrain surrounding East Valley Cattle is relatively flat. The surrounding terrain generally is not greater than the stack base elevation. Therefore, the flat terrain option will be selected for the model.

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4.6. Choice of Meteorology

The full meteorology option will be selected as a worst case scenario for meteorological conditions. This includes all stability classes and wind speeds.

4.7. Discrete and Automated Distance Options

The discrete distance option will be selected to model to the nearest public receptor. The nearest receptor is 100 feet (30.48 meters). This is the minimum distance from the stack location to the leased property boundary.

4.8. Background Concentrations

Kleinfelder is proposing to use IDEQ's default background concentrations for rural/agricultural areas presented in Table 4-1.

Table 4-1: Background Concentrations for Criteria Pollutants

Criteria Pollutant	24-hr (ug/m3)	Annual (ug/m3)	1-hr (ug/m3)	8-hr (ug/m3)	3-hr (ug/m3)
PM_{10}	73	26			
NO_2	17				
SO_2	26	8	--		34
CO			3,600	2,300	

5 APPLICABLE REGULATORY LIMITS

5.1 Methodology for Evaluation of Compliance with Standards

The modeled concentration of criteria pollutants will be compared to the National Ambient Air Quality Standards to demonstrate that the facility impacts will not cause or contribute to an exceedance of the NAAQS. The compliance standards for criteria pollutants are summarized in Table 5-1.

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Table 5-1: Applicable Standards for Criteria Pollutants

Criteria Pollutant	NAAQS 24-hr (ug/m3)	NAAQS Annual (ug/m3)	NAAQS 1-hr (ug/m3)	NAAQS 8-hr (ug/m3)	NAAQS 3-hr (ug/m3)
Total PM	--	--			
PM_{10}	150	--			
$PM_{2.5}$	35	15			
NO_2	--	100			
SO_2	365	80	--		1,300
CO			40,000	10,000	
Lead					

SCREEN3 produces output for a one-hour average only. This one-hour average concentration must be adjusted to estimate the concentration for the appropriate averaging period. The one-hour average model output will be converted to averaging periods consistent with the standard for the pollutant modeled through the use of persistence factors presented in Table 5-2.

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Table 5-2: Persistency Conversion Factors for SCREEN3

Averaging Period	Simple Terrain Conversion Factor
3- hour	0.9
8-hour	0.7
24-hour	0.4
Quarterly	0.13
Annual (Criteria)	0.8
Annual (Carcinogenic TAPs)	0.125

The modeled concentrations of the TAP emissions will be compared to their respective Acceptable Ambient Concentration (AAC) or Acceptable Ambient Concentration for Carcinogens (AACC), presented in IDAPA 58.01.01 Sections 585 and 586. The compliance standards for TAP emissions are summarized in Table 5-3.

Table 5-3: Applicable Standards for TAPs

TAP	AAC (ug/m3) 24-hr Avg	AACC (ug/m3) Annual Avg
Acetaldehyde		0.45
Acrolein	12.50	
Benzene		0.12
Dichloromethane		0.24
Formaldehyde		0.077
Isomers of Xylene	21,750	
Nickel		0.0042
Selenium	0.010	
Styrene	1,000	
Toluene	18,750	
Trichloroethylene	13,450	0.77
Vinyl Chloride		0.14

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5.2 Preliminary Analysis

The proposed project will result in potential emissions of non-carcinogenic TAPs listed in IDAPA 58.01.01.585, including acrolein, isomers of xylene, selenium, styrene, toluene, and trichloroethylene. The potential emissions of these compounds are not expected to exceed their respective listed TAP screening emission levels ("EL") with the exception of trichloroethylene. In addition, the digester will result in emissions of carcinogenic TAPs listed in IDAPA 58.01.01.586 including acetaldehyde, benzene, dichloromethane, formaldehyde, nickel, trichloroethylene, and vinyl chloride. The potential emissions for acetaldehyde is not expected to exceed the listed TAP EL, however potential emissions for benzene, dichloromethane, formaldehyde, nickel, trichloroethylene, and vinyl chloride may exceed each of the respective TAP ELs. Therefore, modeling is expected to be required for these specific TAPs to demonstrate compliance with the Acceptable Ambient Concentration (AAC) for each pollutant.

5.3 Full Impact Analysis

The full impact analysis will include an evaluation of the modeled impacts to ambient air quality using SCREEN3. If the maximum modeled concentrations exceed significant contribution levels, then the modeled impacts will be added to the respective background concentration for each pollutant and compared to the ambient air quality standards to show compliance.

5.4 Presentation of Results

The results of the air quality modeling assessment will be included in a detailed report, as an appendix to the Permit to Construct application submitted for the project. A summary of the results will also be included in the PTC application. We will follow the State of Idaho Air Quality Modeling Guidelines, dated December 31, 2002.

The report will include a detailed description of the source and the potential emissions, modeling methods and results. The modeling results will be presented in a tabular format for easy comparison to the applicable standards. The permit application will include documentation, and references for the engineering parameters used in the modeling assessment.

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If you have any questions, please contact the undersigned at (208) 893-9700.

Sincerely,

KLEINFELDER WEST, INC.

Kelli Wetzel
Air Quality Engineer

Estee Lafrenz
Air Quality Engineer

Attachments:

References

Figures

Figure 1: Site Location Map
Figure 2: Vicinity Map
Figure 3: Facility Layout Detail

Modeling Protocol Checklist

KLEINFELDER 2315 S. Cobalt Point Way, Meridian, ID 83642 (208) 893-9700 (208) 893-9703 fax

REFERENCES

EPA, 2000. *Meteorological Monitoring Guidance for Regulatory Modeling Applications*. EPA Publication No. EPA-454/R-99-005. U.S. Environmental Protection Agency, Research Triangle Park, NC.

EPA, 1995. *SCREEN3 Model User's Guide*. U.S. Environmental Protection Agency, Research Triangle Park, NC.

EPA's SCRAM Web site: http://www.epa.gov/scram001/index.htm.

IDAPA 58.01.01, et seq. *Rules for the Control of Air Pollution in Idaho.*

IDEQ, 2002. *State of Idaho Air Quality Modeling Guideline*, Doc. IDAQ-011 (rev. 1 12/31/02).

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Insert Figures Here

Table A-1
Modeling Protocol Checklist for New Minor Sources or Minor Modifications

Checklist Item	Completed (yes / no)	Protocol Section
Introduction and Purpose	Yes	2
• General overview, facility description, terrain description	Yes	2.1
• Project Overview	Yes	2.1
• Goals of the air quality impact analysis (i.e., demonstrate compliance for a permit to construct or a Tier II operating permit)	Yes	2.1
• Applicable regulations and requirements	Yes	Exec Summary
• Pollutants of concern	Yes	Exec Summary
Emission and Source Data	Yes	3
• Facility processes and emission controls effected by the permitting action	Yes	3.1
• Include a list of emission points that will be included in the application. Present a table showing current actual and future allowable emission rates (in maximum pounds per hour tons per year) and the requested emission increase (future allowable minus current actual)	Yes	3.2
• Good engineering practice (GEP) stack-height analysis	Yes	3.3
• Facility layout: location of sources, buildings, and fence lines	Yes	3.4
• Source parameters (emissions rates, UTM coordinates, stack height, stack elevation, stack diameter, stack-gas exit velocity, and stack-gas exit temperature) for each new or modified emission point	Yes	3.5
• Methodology for including area and volume sources in the modeling analysis	Yes	3.6
• Methodology for including/excluding sources from the modeling analysis	Yes	3.7
Air Quality Modeling Methodology	Yes	4
• Model selection and justification	Yes	4.1
• Model setup and application - Model options (i.e., regulatory default) - *Terrain Options* - *Land-use analysis* - *Building Downwash* - *Choice of Meteorology* - *Discrete Distance Option*	Yes	4.2
• Elevation data - *Methodology for accounting for complex terrain*	n/a	

Table A-1 (Continued)
Modeling Protocol Checklist for New Minor Sources or Minor Modifications

Checklist Item	Completed (yes / no)	Protocol Section
• Receptor network - *Description of receptor grids – include methodology for ensuring the maximum concentration will be estimated* - *Discussion/justification of ambient air* - *Determination of receptor elevations*	Yes	4.7
• Meteorological data - *Selection of meteorological databases – justification of appropriateness of meteorological data to area of interest* - *Meteorological data processing* - *Meteorological data analysis (e.g., wind rose)*	Yes	4.6
• Background concentrations	Yes	4.8
Applicable Regulatory Limits	Yes	5
• Methodology for evaluation of compliance with standards (i.e., determination of design concentration)	Yes	5.1
• Full impact analysis - *TAPs analysis* - *NAAQS analysis*	Yes	5.1
• Presentation of results – state how the results of the modeling analysis will be displayed (i.e., list what information will be included)	Yes	5.1
References	Yes	attachment

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APPENDIX C

Modeling Protocol Approval Letter

STATE OF IDAHO
DEPARTMENT OF
ENVIRONMENTAL QUALITY

1410 NORTH HILTON, BOISE, ID 83706 · (208) 373-0502

C. L. "BUTCH" OTTER, GOVERNOR
TONI HARDESTY, DIRECTOR

April 19, 2008

Kelli Wetzel
Kleinfelder
Meridian, Idaho

RE: Modeling Protocol for Various Manure Digester Projects at Dairies in Idaho

Keilli:

DEQ received your dispersion modeling protocol on April 15, 2008. The modeling protocol was submitted on behalf of Andgar Corporation (Andgar). The modeling protocol proposes methods and data for use in an ambient air impact analyses in support of 15-day pre-permit construction approval Permit to Construct applications for construction of electrical generators, combusting biogas generated from manure digesters, at various dairies in Idaho.

The modeling protocol has been reviewed and DEQ has the following comments:

- Comment 1: Approval of this protocol will be considered as an approved protocol for projects involving the operation of electrical generators, operated by Andgar, at Idaho dairies.

- Comment 2: Elevated Terrain. Review of the quadrangle map indicates the presence of substantially elevated terrain about ¼ mile west of the emissions sources. The submitted application must demonstrate that impacts to such areas will not cause or significantly contribute to a violation of any air quality standards. In situations where there are numerous ambient air locations within elevated terrain, AERMOD should be used.

- Comment 3: Downwash must be adequately accounted for. In the submitted protocol, it appears the mechanical building is the only building that could cause plume downwash (the stacks are not within a distance of 5L of any other building, where L is the lesser dimension of building height or projected width). For other applications, all buildings where the stack(s) are within 5L must be assessed to determine the controlling building with regard to building downwash. The controlling building is the one having the highest GEP stack height. GEP is given by $H = S + 1.5L$, where S is the building height.

In situations where there are numerous buildings that could contribute to plume downwash, AERMOD should be used to properly account for downwash.

- Comment 4: The application should provide documentation and justification for stack parameters used in the modeling analyses, clearly showing how stack gas temperatures and flow rates were estimated or calculated. In most instances, applicants should use typical parameters, not maximum temperatures and flow rates. In cases where such parameters were verified by a system audit, the application should indicate how such parameters were verified (by direct measurement, by calculation, etc.). The actual calculation sheets are not required in most instances.

- Comment 5: Correction of persistence factor: Table 5-2 in the protocol provides persistence factors to use with SCREEN3. The annual factor for criteria pollutants was listed as 0.8. The correct factor is 0.08.

DEQ's modeling staff considers the submitted dispersion modeling protocol, with resolution of the additional items noted above, to be approved. It should be noted, however, that the approval of this modeling protocol is not meant to imply approval of a completed dispersion modeling analysis. Please refer to the *State of Idaho Air Quality Modeling Guideline*, which is available on the Internet at http://www.deq.state.id.us/air/permits_forms/permitting/modeling_guideline.pdf, for further guidance.

To ensure a complete and timely review of the final analysis, our modeling staff requests that electronic copies of all modeling input and output files are submitted with an analysis report. If you have any further questions or comments, please contact me at (208) 373-0112.

Sincerely,

Kevin Schilling

Kevin Schilling
Stationary Source Air Modeling Coordinator
Idaho Department of Environmental Quality
208 373-0112

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APPENDIX D

Emissions Calculations and Screen3 Output

Emission Calculations
East Valley Cattle, Declo, Idaho

Four 750 kW Genset Electrical Generators (Guascor 560)

Capacity Assumptions		
Power	4,228	bhp
Fuel consumption	6,570	btu/bhp-hour
Fuel input at capacity	27.8	MMBtu/hr

Pollutant	Emission factor (lb/MMbtu)	Data Source	Emissions		
			lbs/hr	tons/yr	grams/sec
PM10	9.99E-03	AP-42 Section 3.2, Table 3.2-2 (includes filterable and	0.28	1.22	3.5E-02
PM2.5	9.99E-03	condensible)	0.28	1.22	3.5E-02
SO2	7.22E-01	Vendor	20.05	87.8	2.5E+00
NOx	3.36E-01	Vendor	9.32	40.8	1.2E+00
CO	7.38E-01	Vendor	20.51	89.8	2.6E+00
VOC	3.36E-01	Vendor	9.32	40.8	1.2E+00
Lead	nd	Vendor			0.0E+00
Acetaldehyde	5.30E-05	EPA AP-42 Section 3.1, April 2000 (Rating D)	1.5E-03	6.4E-03	1.9E-04
Acrolein	2.60E-05	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	7.2E-04	3.2E-03	9.1E-05
Benzene	6.90E-04	Radian fire database 1993 release (Rating U)	1.9E-02	8.4E-02	2.4E-03
Dichloromethane	1.01E-04	Radian fire database 1993 release (Rating U)	2.8E-03	1.2E-02	3.5E-04
Formaldehyde	1.90E-04	EPA AP-42 Section 3.1, April 2000 (Rating D)	5.3E-03	2.3E-02	6.6E-04
Isomers of Xylene	1.37E-04	Radian fire database 1993 release (Rating U)	3.8E-03	1.7E-02	4.8E-04
Nickel	2.00E-06	EPA AP-42 Section 3.1, April 2000 (Rating D)	5.6E-05	2.4E-04	7.0E-06
Selenium	1.10E-05	EPA AP-42 Section 3.1, April 2000 (Rating D)	3.1E-04	1.3E-03	3.8E-05
Styrene	5.26E-05	Radian fire database 1993 release (Rating U)	1.5E-03	6.4E-03	1.8E-04
Toluene	2.62E-04	Radian fire database 1993 release (Rating U)	7.3E-03	3.2E-02	9.2E-04
Trichloroethylene	2.00E-05	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	5.6E-04	2.4E-03	7.0E-05
Vinyl Chloride	5.60E-05	JMM cons eng. Dec 10, 1990 - Fire database (Rating U)	1.6E-03	6.8E-03	2.0E-04

Total Emissions Compared to TAP Screening Els

Pollutant	Emissions			TAP Screening	
	lbs/hr	tons/yr	grams/sec	TAP Screening EL (lb/hr)	Exceeds EL?
PM10	0.28	1.22	3.5E-02	Not applicable	
PM2.5	0.28	1.22	3.5E-02		
SO2	20.05	87.80	2.5E+00		
NOx	9.32	40.83	1.2E+00		
CO	20.51	89.82	2.6E+00		
VOC	9.32	40.83	1.2E+00		
Lead					
Acetaldehyde	1.5E-03	6.4E-03	1.9E-04	3.0E-03	No
Acrolein	7.2E-04	3.2E-03	9.1E-05	1.7E-02	No
Benzene	1.9E-02	8.4E-02	2.4E-03	8.0E-04	Yes
Dichloromethane	2.8E-03	1.2E-02	3.5E-04	1.6E-03	Yes
Formaldehyde	5.3E-03	2.3E-02	6.6E-04	5.1E-04	Yes
Isomers of Xylene	3.8E-03	1.7E-02	4.8E-04	2.9E+01	No
Nickel	5.6E-05	2.4E-04	7.0E-06	2.7E-05	Yes
Selenium	3.1E-04	1.3E-03	3.8E-05	1.3E-02	No
Styrene	1.5E-03	6.4E-03	1.8E-04	6.7E+00	No
Toluene	7.3E-03	3.2E-02	9.2E-04	2.5E+01	No
Trichloroethylene	5.6E-04	2.4E-03	7.0E-05	5.1E-04	Yes
Vinyl Chloride	1.6E-03	6.8E-03	2.0E-04	9.4E-04	Yes

Modeling Results

Persistency Factors	
3 hour	**0.9**
8 hour	**0.7**
24 hour	**0.4**
Annual criteria	**0.08**
Annual TAPs	**0.125**

Maximum SCREEN3 Impact using concentration input of 1 gram/sec (X/Q):
Model Results **292.50** (ug/m3)/(g/s)

Four 750 kW Genset Electrical Generators (Guascor 560)

Pollutant	Emissions (grams/sec)	Estimated impacts (ug/m3) (1-hr avg)
PM10	3.50E-02	1.02E+01
PM2.5	3.50E-02	1.02E+01
SO2	2.53E+00	7.39E+02
NO2 (Note 1)	8.81E-01	2.58E+02
CO	2.58E+00	7.56E+02
VOC	1.17E+00	Modeling not conducted
Lead	0.00E+00	
Acetaldehyde	1.85E-04	Emissions are below EL
Acrolein	9.10E-05	Emmisions are below EL
Benzene	2.41E-03	7.06E-01
Dichloromethane	3.53E-04	1.03E-01
Formaldehyde	6.65E-04	1.95E-01
Isomers of Xylene	4.79E-04	Emmisions are below EL
Nickel	7.00E-06	2.05E-03
Selenium	3.85E-05	Emmisions are below EL
Styrene	1.84E-04	Emmisions are below EL
Toluene	9.17E-04	Emmisions are below EL
Trichloroethylene	7.00E-05	2.05E-02
Vinyl Chloride	1.96E-04	5.73E-02

Notes
1. NOx conversion to NO2 assumed 0.75, per EPA guidance.

Pollutant	Emissions (grams/sec)	Estimated impacts (ug/m3) (1-hr avg)	1-hr average adjusted to 24 hr average	1 -hr average adjusted to annual average	1-hr average adjusted to 8 hr average	1-hr average adjusted to 3 hr average
PM10	3.50E-02	1.02E+01	4.09E+00	8.18E-01		
PM2.5	3.50E-02	1.02E+01	4.09E+00	8.18E-01		
SO2	2.53E+00	7.39E+02	2.96E+02	5.91E+01		6.65E+02
NO2 (Note 1)	8.81E-01	2.58E+02		2.06E+01		
CO	2.58E+00	7.56E+02			5.29E+02	
VOC	1.17E+00	Modeling not conducted				
Lead	0.00E+00					
Acetaldehyde	1.85E-04	Emissions are below EL				
Acrolein	9.10E-05	Emissions are below EL				
Benzene	2.41E-03	7.06E-01		8.82E-02		
Dichloromethane	3.53E-04	1.03E-01		1.29E-02		
Formaldehyde	6.65E-04	1.95E-01		2.43E-02		
Isomers of Xylene	4.79E-04	Emissions are below EL				
Nickel	7.00E-06	2.05E-03		2.56E-04		
Selenium	3.85E-05	Emmisions are below EL				
Styrene	1.84E-04	Emissions are below EL				
Toluene	9.17E-04	Emissions are below EL				
Trichloroethylene	7.00E-05	2.05E-02	8.19E-03	2.56E-03		
Vinyl Chloride	1.96E-04	5.73E-02		7.17E-03		

Notes

1. NOx conversion to NO2 assumed 0.75, per EPA guidance.

DEQ Background Concentrations For Rural Areas

Pollutant		Background Concentration (ug/m3)
PM10	24 hour	73
	Annual	26
SO2	3 hour	34
	24 hour	26
	Annual	8
NO2	Annual	17
CO	1 hour	3,600
	8 hour	2,300

Estimated Impacts Including Background Concentrations

Pollutant		Modeled Impact (ug/m3)
PM10	24 hour	77
	Annual	27
SO2	3 hour	699
	24 hour	322
	Annual	67
NO2	Annual	38
CO	1 hour	4,356
	8 hour	2,829

Pollutant	Averaging Period	Modeled Impacts ($\mu g/m^3$) (Note 1)	NAAQS or AAC ($\mu g/m^3$)
PM_{10}	24 hour Annual	77.09 26.82	150 50
$PM_{2.5}$	24 hour Annual	Note 2	35 15
NO_2	Annual	37.61	100
SO_2	3 hour 24 hour Annual	698.90 321.51 67.10	1,300 365 80
CO	1 hour 8 hour	4,355.75 2,829.03	40,000 10,000
Acetaldehyde	Annual	Below TAP EL	
Acrolein	24 hour	Below TAP EL	
Benzene	Annual	0.09	0.12
Dichloromethane	Annual	0.013	0.24
Formaldehyde	Annual	0.024	0.077
Isomers of Xylene	24 hour	Below TAP EL	
Nickel	Annual	0.0003	0.0042
Selenium	24 hour	Below TAP EL	
Styrene	24 hour	Below TAP EL	
Toluene	24 hour	Below TAP EL	
Trichloroethylene	24 hour Annual	0.008 0.003	13,450 0.77
Vinyl Chloride	Annual	0.007	0.14

Note 1 – Modeled Impacts for primary pollutants considers background concentrations.
Note 2 – Background for PM2.5 has not been established and modeled impacts could not be determined

Assumptions:

2,500 ppm SO2 concentration
379 scf gas/lb-mole
34 Molecular weight of H2S
64 Molecular weight of SO2
13.19 scf/sec exhaust rate 1139616

$$\frac{2{,}500 \text{ cf H2S}}{1.00\text{E+}06 \text{ cf}} \times \frac{13.19 \text{ scf}}{1 \text{ sec}} \times \frac{3{,}600 \text{ sec}}{1 \text{ hr}} \times \frac{1 \text{ lb-mole}}{379 \text{ scf}} \times \frac{34 \text{ mole}}{1} = \frac{10.65 \text{ lb H2S}}{\text{hr}}$$

$$\frac{10.65 \text{ lb H2S}}{1 \text{ hr}} \times \frac{64 \text{ mole SO2}}{34 \text{ mole H2S}} = \frac{\mathbf{20.05 \text{ lb SO2}}}{\mathbf{hr}}$$

Emission Factor

$$\frac{20.05 \text{ lb SO2}}{\text{hr}} \times \frac{\text{hr}}{27.78 \text{ MMBtu}} = \frac{\mathbf{0.722 \text{ lb SO2}}}{\mathbf{MMBtu}}$$

```
 ***  SCREEN3 MODEL RUN  ***
 *** VERSION DATED 96043 ***

C:\Lakes\ScreenView\dcd.scr

SIMPLE TERRAIN INPUTS:
   SOURCE TYPE              =        POINT
   EMISSION RATE (G/S)      =      1.00000
   STACK HEIGHT (M)         =       8.2300
   STK INSIDE DIAM (M)      =        .2540
   STK EXIT VELOCITY (M/S)=        39.9300
   STK GAS EXIT TEMP (K)    =      628.0000
   AMBIENT AIR TEMP (K)     =      293.0000
   RECEPTOR HEIGHT (M)      =         .0000
   URBAN/RURAL OPTION       =         RURAL
   BUILDING HEIGHT (M)      =        6.7100
   MIN HORIZ BLDG DIM (M) =        13.7200
   MAX HORIZ BLDG DIM (M) =        29.2600

THE REGULATORY (DEFAULT) MIXING HEIGHT OPTION WAS SELECTED.
THE REGULATORY (DEFAULT) ANEMOMETER HEIGHT OF 10.0 METERS WAS ENTERED.


BUOY. FLUX =    3.369 M**4/S**3;  MOM. FLUX =   11.998 M**4/S**2.

*** FULL METEOROLOGY ***

**********************************
*** SCREEN DISCRETE DISTANCES ***
**********************************

*** TERRAIN HEIGHT OF    0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES ***

  DIST      CONC              U10M   USTK  MIX HT   PLUME   SIGMA   SIGMA
   (M)   (UG/M**3)   STAB   (M/S)  (M/S)    (M)   HT (M)  Y (M)   Z (M)  DWASH
-------  ----------  ----  -------------  ------  ------  ------  ------  -----
    30.   292.5        4    10.0   10.0  3200.0    8.30    2.72    3.83    SS

 DWASH=   MEANS NO CALC MADE (CONC = 0.0)
 DWASH=NO MEANS NO BUILDING DOWNWASH USED
 DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
 DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
 DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

**************************************
     *** REGULATORY (Default) ***
    PERFORMING CAVITY CALCULATIONS
  WITH ORIGINAL SCREEN CAVITY MODEL
          (BRODE, 1988)
**************************************


 *** CAVITY CALCULATION - 1 ***       *** CAVITY CALCULATION - 2 ***
  CONC (UG/M**3)      =    .0000        CONC (UG/M**3)      =    .0000
  CRIT WS @10M (M/S) =    99.99        CRIT WS @10M (M/S) =    99.99
  CRIT WS @ HS (M/S) =    99.99        CRIT WS @ HS (M/S) =    99.99
  DILUTION WS (M/S)  =    99.99        DILUTION WS (M/S)  =    99.99
  CAVITY HT (M)       =    7.46        CAVITY HT (M)       =    6.75
  CAVITY LENGTH (M)  =    24.50        CAVITY LENGTH (M)  =    15.89
  ALONGWIND DIM (M)  =    13.72        ALONGWIND DIM (M)  =    29.26
```

CAVITY CONC NOT CALCULATED FOR CRIT WS > 20.0 M/S. CONC SET = 0.0

****
END OF CAVITY CALCULATIONS
****

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)
SIMPLE TERRAIN	292.5	30.	0.

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

KLEINFELDER
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APPENDIX E

Affidavit of Publication – Public Notice Meeting

Affidavit of Publication

STATE OF IDAHO)
COUNTY OF TWIN FALLS) SS.

I, Ruby Aufderheide, being first duly sworn upon oath, depose and say that I am Legal Clerk of the TIMES-NEWS,published daily at, Twins Falls, Idaho, and do solemnly swear that a copy of the notice of advertisement, as per clipping attached, was published in the regular and entire issue of said newspaper, and not in any supplement thereof, for one ~~consecutive~~ publication, commencing with the issue dated 5th day of May, 2008 and ending with the issue dated 5th day of May, 2008

And I do further certify that said newspaper is a consolidation, effective February 16, 1942, of the Idaho Evening Times, published theretofore daily except Sunday, and the Twin Falls News, published theretofore daily except Monday, both of which newspapers prior to consolidation had been published under said names in said city and county continuously and uninterruptedly during a period of more than twelve consecutive months, and said TIMES-NEWS, since such consolidation, has been published as a daily newspaper except Saturday, until July 31, 1978, at which time said newspaper began daily publication under said name in said city and county continuously and uninterrupted.

And I further certify that pursuant to Section 60-108 Idaho Code, Thursday of each week has been designated as the day on which legal notice by law or by order of any court of competent jurisdiction within the state of Idaho to be issued thereof Thursday is announced as the day on which said legal will be published.

Ruby Aufderheide

Ruby Aufderheide, Legal Clerk

STATE OF IDAHO
COUNTY OF TWIN FALLS

On this 5th day of May, 2008, before me,

a Notary Public, personally appeared Ruby Aufderheide, known or identified to me to be the person whose name subscribed to the within instrument, and being by me first duly sworn, declared that the statements therein are true, and acknowledged to me that he executed the same.

Linda Capps McGuire

Notary Public for Idaho
Residing at Twin Falls, Idaho.

My commision expires: 5-19-09

PUBLIC NOTICE

Cargill Environmental Finance has applied for an air quality permit to construct for an anaerobic digester located at 2735 East 700 South in Declo, ID. An informational meeting will be held in the Best Western Burley Inn & Convention Center Cassia II Meeting Room located at 800 North Overland Avenue, Burley, ID at 7:00pm on May 15, 2008.

PUBLISH: May 5, 2008

LINDA CAPPS-McGUIRE
NOTARY PUBLIC
STATE OF IDAHO

KLEINFELDER
Bright People. Right Solutions.

APPENDIX F

EPA letter regarding 40 CFR 60, Subpart JJJJ

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

APR 24 2008

OFFICE OF
ENFORCEMENT AND
COMPLIANCE ASSURANCE

Jonathan Pettit
Air Quality Permit Analyst
Idaho Department of Environmental Quality
Air Quality Division
1410 N. Hilton
Boise, Idaho 83706-1255

Dear Mr. Pettit:

This is in response to your request for guidance regarding the use of Air to Fuel Ratio controllers (AFR) on lean burn and rich burn engines that are subject to the New Source Performance Standards for Stationary Spark Ignition Internal Combustion Engines at 40 CFR Part 60, Subpart JJJJ. Specifically, you request clarification of the provisions at 40 CFR Part 60, Section 60.4243(g) regarding: 1) whether use of an AFR is an enforceable requirement for engines that use three way catalysts; and 2) does the use of an AFR apply to both lean burn and rich burn engines that use three way catalysts.

Although not stated explicitly in 40 CFR Part 60, Subpart JJJJ, the use of an AFR is an enforceable requirement for rich burn engines that use three way catalysts. Question 10.2.2 in the 40 CFR Part 60, Subpart JJJJ Response To Comment document clarifies this requirement by stating that:

> An AFR is necessary and must be included with the operation of three way catalysts on rich burn engines and will have to be operated in an appropriate manner to ensure the proper engine operation and to minimize emissions.

Three way catalysts simultaneously reduce oxides of nitrogen (NO_X), hydrocarbons (HC) and carbon monoxide (CO) through a series of reduction and oxidation reactions for engines that operate at or near stoichiometric conditions. The AFR is necessary because it maintains the appropriate air to fuel ratio so that these oxidation and reduction reactions can take place in the catalyst. In their absence, the three way catalyst would not work properly, and the engine would be unable to consistently comply with the emission requirements specified in 40 CFR Part 60, Subpart JJJJ.

The provisions at 40 CFR Part 60, Section 60.4243(g) are not intended to apply to lean burn engines. This is because three way catalysts are designed to reduce HC, CO and NO_X emissions from engines that run at or near stoichiometric conditions and not from lean burn engines that operate at very lean air to fuel ratios and emit exhaust gases with high levels of excess air.

This response has been coordinated with the Office of General Counsel and the Office of Air Quality Planning and Standards. If you have any questions, please contact John DuPree of my staff at (202) 564-5950.

Sincerely yours,

Kenneth A. Gigliello, Acting Director
Compliance Assessment and Media Programs Division
Office of Compliance